7. Sign Lighting

7.1 Overview

The Sign Lighting Standards conserve energy, reduce peak electric demand, and are technically feasible and cost effective. They set minimum control requirements, maximum allowable power levels and minimum efficacy requirements.

Sign lighting is addressed in this chapter.

The Standards do not allow trade-offs between sign lighting power allowances and other end uses including outdoor lighting, indoor lighting, HVAC, building envelope, or water heating (§147(a)).

7.1.1 History and Background

Regulations for lighting have been in effect in California since 1977, but until the adoption of the 2005 Standards only addressed indoor lighting, inside spaces that were air conditioned or heated, and outdoor lighting that was connected to a lighting panel when the lighting panel was located inside a conditioned building. The 2005 Standards expanded the scope to include most outdoor lighting applications, indoor and outdoor sign lighting applications, and indoor lighting applications in unconditioned buildings.

The 2008 Sign Lighting Standards evolved over a three year period through a dynamic, open, public process. The Energy Commission solicited ideas, proposals, and comments from a number of interested parties, and encouraged all interested persons to participate in a series of public hearings and workshops through which the Energy Commission gathered information and viewed presentations on energy efficiency possibilities from a variety of perspectives. The Energy Commission hired a consulting team that included a number of nationally recognized lighting experts to assist in the development of the Standards.

7.1.2 Scope and Application

The 2008 Sign Lighting Standards address both indoor and outdoor signs. The Standards include control requirements for all illuminated signs (§133), as well as set limits on installed lighting power for internally illuminated and externally illuminated signs (§148).

No Trade-offs

The Standards do not allow trade-offs between sign lighting power allowances and indoor lighting or outdoor lighting, HVAC, building envelope, or water heating.

7.1.3 Summary of Requirements

§119,§130, §133, §148 and §149

A. Mandatory Measures

The Standards require that indoor and outdoor sign lighting be automatically controlled so that it is turned off during daytime hours and during other times when it is not needed. These controls must be certified by the manufacturer to the Energy Commission and listed in the Energy Commission directories. More detail on the mandatory measures is provided in Section 7.2.

In brief, the mandatory sign lighting requirements include:

- Automatic shutoff controls,
- Dimming controls, and
- Demand responsive controls for electronic message centers

All lighting controls must meet the requirements of §119 as applicable. The Sign Lighting Standards are the same throughout the state and are independent of outdoor Lighting Zones.

B. Sign Lighting Power

Sign Lighting Standards apply to both indoor and outdoor signs and contain two different prescriptive compliance options: Specific technology and watts per square foot approaches. The watt per square foot approach specifies a maximum lighting power that can be installed, expressed in W/ft² of sign area. The specific technology approach specifies that the signs shall be illuminated with efficient lighting sources (electronic ballasts, high efficacy lamps, efficient power supplies and efficient transformers). There are no performance compliance options available for sign lighting. Table 7-1 below summarizes the watts per square foot and specific technology sign compliance approaches. Detailed requirements are given in Section 7.3.

Table 7-1 – Sign Compliance Alternatives

Watts Per Square Foot Approach (See Section 7.3.1 for more information about the Watts Per Square Foot Approach)	
Type of Sign	Allowed Lighting Power
Internally Illuminated	12 W/ft²
Externally Illuminated	2.3 W/ft²
Specific Technology Approach(See Section 7.3.2 for more information about the Specific Technology Approach)	
Signs illuminated by only or more of the following light sources: 1. High pressure sodium 2. Pulse-start or ceramic metal halide with a ballast efficiency ≥ 88%, per ANSI C82.6-2005 3. Pulse-start metal halide ≤ 320 watt, ≠ 250 or 175 watt, and with a ballast efficiency ≥ 80%, per ANSI C82.6-2005 4. Neon and cold cathode with a transformer or power supply having: a. Efficiency ≥ 75% with output current< 50 mA, or b. Efficiency ≥ 68% with output current ≥ 50 mA, where efficiency is defined as the ratio of output wattage to input wattage at 100% tubing load 5. Fluorescent lamps with a minimum color rendering index (CRI) of 80 6. Light emitting diodes (LEDs) with a power supply efficiency ≥ 80% EXCEPT LEDs powered with 120 volt AC to lower voltage AC or DC power supplies rated ≤ 250 watt must comply with Appliance Efficiency Regulations (Title 20) 7. Compact fluorescent lamps that do not contain medium based sockets. (E24/E26) 8. Electronic ballasts ≥ 20 kHz	

7.2 Mandatory Measures

The mandatory features and devices must be included in all sign lighting projects when they are applicable. These features have been proven to be cost-effective over a wide range of sign lighting applications. The mandatory measures require that the performance of lighting controls be certified by the manufacturers to the Energy Commission, and that sign lighting systems have controls for efficient operation. Mandatory measures for signs are specified in §119, §130, and §133. These are similar to the mandatory measures for indoor and outdoor lighting.

Mandatory Measures Note Block

The person with overall responsibility must ensure that the Mandatory Measures that apply to the project are listed on the plans. The format of the list is left to the discretion of the Principal Designer.

Sample Notes Block – Sign Lighting Mandatory Measures

SIGN LIGHTING CONTROLS

- ☐ **Controls for All Signs.** All signs with permanently connected lighting shall meet the requirements of Section 133.
- ☐ **Automatic Time Switch Control**. All signs with permanently connected lighting shall be controlled with an automatic time switch control that complies with the applicable requirements of Section 119.
- ☐ **Photocontrol or outdoor astronomical time switch control**. All

outdoor signs shall be controlled with a photocontrol or outdoor astronomical time switch control unless exempted from the exceptions. See Section 133(a)2.

- ☐ **Dimming**. All outdoor signs shall be controlled with a dimmer that provides the ability to automatically reduce s sign power by a minimum of 65 percent during nighttime hours unless exempted from the 5 possible exceptions. See Section 133(a)3.
- ☐ Demand Responsive Electronic Message center Control (EMC), newly connected lighting power load greater than 15 kW shall have a control installed that is capable of reducing the lighting power by a minimum of 30 % when receiving a demand response signal that is sent out by the local uility.

7.2.1 Certification of Lighting Controls

§119

Manufacturers of lighting control products shall certify the performance of their products to the California Energy Commission in accordance with the applicable provisions in §119. It is the responsibility of the designer, however, to specify products that meet these requirements. Code enforcement officials, in turn, check that the lighting controls specified are indeed certified.

The certification requirement applies to photocontrols, astronomical time switches, and automatic controls. Lighting control devices may be individual devices or systems consisting of two or more components, such as an Energy Management Control System (EMCS), many of these requirements are part of standard practice in California and should be well understood by those responsible for designing or installing the sign lighting.

All automatic sign lighting control devices must be certified by the manufacturer with the Energy Commission before they can be installed. Once a device is certified, it is listed in the Directory of Automatic Lighting Control Devices. Call the Energy Hotline at 1-800-772-3300 to obtain more information.

All control devices must have instructions for installation and start-up calibration, must be installed in accordance with such directions, and must have a status signal (visual or audio) that warns of failure or malfunction. See Section 5.2.1.2 of the Nonresidential Compliance Manual for more information about certifying lighting controls.

7.2.2 Sign Lighting Installed Wattage

§130(d).

The lighting wattage of signs shall be determined in accordance with the applicable provisions of §130(d). The rules for determining lighting wattage are discussed in detail in Section 5.5, Calculating Lighting Power for Nonresidential Indoor Lighting.

7.2.3 Automatic Lighting Controls

§133(a)1 and §133(a) 2.

All signs, both indoor and outdoor, with permanently connected lighting shall be controlled with an automatic time switch control that complies with the applicable requirements of §119.

All outdoor signs shall be controlled with a photocontrol or outdoor astronomical time switch control. However, outdoor signs in tunnels and large covered areas that require illumination during daylight hours are not required to be controlled with a photocontrol or outdoor astronomical time switch control.

Controls used to meet these requirements shall be certified by the manufacturer and listed in the Energy Commission directory.

7.2.4 Dimming Controls

§133(a) 3.

All outdoor signs with permanently connected lighting must be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours.

The dimming control requirements do not apply to:

1. Signs that are illuminated for less than one hour per day during daylight hours.
2. Outdoor signs in tunnels and large covered areas that require illumination during daylight hours.
3. Metal halide, high pressure sodium, cold cathode, and neon lamps used to illuminate signs or parts of signs.

Controls used to meet these requirements shall be certified by the manufacturer and listed in the Energy Commission directory.

7.2.5 Demand Responsive Electronic Message Center Controls

§133(a) 4.

All electronic message centers (EMCs) with a new connected lighting greater than 15 kW must have a control capable of reducing the lighting power by at least 30 percent upon receiving a demand response signal sent by the local utility.

The demand responsive controls do not apply to EMCs required by a health or life safety statue, ordinance, or regulation, including but not limited to exit signs and traffic signs. The requirements apply to all other types of signs.

Example 7-1

Question

What are the mandatory sign lighting requirements for indoor signs?

Answer

The mandatory sign lighting requirements for indoor signs include:

1. An automatic time switch control that complies with the applicable requirements of §119.

2. Large indoor electronic message centers (EMC) (lighting power load > 15 kW) shall be capable of reducing lighting power ≥ 30 percent when receiving a demand response signal sent out by the local utility. However, EMCs required by a health or life safety statue, ordinance, or regulation are not required to be controlled by a demand response.

Example 7-2

Question

What are the mandatory sign lighting requirements for outdoor signs?

Answer

1. The mandatory sign lighting requirements for outdoor signs include:

2. An automatic time switch control that complies with the applicable requirements of §119.

3. A photocontrol or outdoor astronomical time switch control.

4. All outdoor signs that are illuminated both day and night shall be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours.

5. Large outdoor electronic message centers (EMC) (lighting power load > 15 kW) shall be capable of reducing lighting power ≥ 30 percent when receiving a demand response signal sent out by the local utility. However, EMCs required by a health or life safety statue, ordinance, or regulation are not required to be controlled by a demand response.

Example 7-3

Question

Are there any situations when a photocontrol or outdoor astronomical time switch is not required for outdoor signs?

Answer

Yes, photocontrols or outdoor astronomical time switch controls are not required for outdoor signs in tunnels and large covered areas that require illumination during daylight hours.

Example 7-4

Question

How do I determine if an outdoor sign is illuminated both day and night so as to require the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours?

Answer

All outdoor signs that are illuminated at night, and for one of more hours per day during daylight hours, shall be considered to be illuminated both day and night.

Example 7-5

Question

Are there situations when an outdoor sign that is illuminated both day and night is not required to be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during night-time hours?

Answer

Yes, following are the two exceptions when an outdoor sign that is illuminated both day and night is not required to be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours:

1. Outdoor signs in tunnels and large covered areas that require illumination during daylight hours.

2. Metal halide, high pressure sodium, cold cathode, and neon lamps used to illuminated signs or parts of signs.

Example 7-6

Question

What is the responsibility of the sign lighting designer with regard to using lighting controls that are certified to the Energy Commission and listed in the Energy Commission directories?

Answer

It is the responsibility of the manufacturer to certify the controls and to present the data to the Energy Commission so that it can be listed in the Energy Commission directories. It is the responsibility of the sign lighting designer to specify controls that have been certified and listed.

Example 7-7

Question

Because the Standards require sign lighting to be controlled by an automatic time switch control, will a sign on the inside of a mall be required to be turned off during the day?

Answer

No, the signs will not be required to be turned off during the day. The automatic time switch control will allow the owner/occupant to program their signs to be automatically turned on and off in accordance with their particular needs.

7.3 Sign Lighting Energy Requirements

The Sign Lighting Standards apply to all internally illuminated (cabinet) signs, externally illuminated signs, unfiltered light emitting diodes (LEDs), and unfiltered neon, whether used indoors or outdoors. Examples are internally illuminated and externally illuminated signs, including billboards, and off-premise and on-premise signs.

§148 do not apply to unfiltered incandescent lamps that are not part of an electronic message center (EMC), internally illuminated sign, or an externally

illuminated sign. In addition, §148 does not apply to traffic signs or exit signs. Exit signs and traffic signs must meet the requirements of the Appliance Efficiency Regulations (Title 20).

Even though the Standards take into consideration Outdoor Lighting Zones (OLZs) for outdoor lighting applications like parking lots, the Outdoor Sign Standards are the same throughout the state and are independent of Outdoor Lighting Zones.

§148 provide two alternative ways to comply with the Sign Lighting Standards. Both alternatives encourage the use of readily available, cost-effective lighting technology. The two alternatives are as follows:

1. **Alternative 1 -Watts Per Square Foot Approach**. This option sets the maximum power (watts) per ft² of sign. This approach allows sign makers maximum flexibility. It enables companies to introduce, develop and use any promising new lighting technology as long as it meets the power allowance. There are no constraints on the types of lighting equipment that a sign maker can use to comply under this approach, just as long the manufacturer does not exceed the maximum watts allowed for a sign of that size.

   The maximum allowed lighting power is determined according to §148(a), and wattage must be determined according to the applicable provision of §130(d). §130(d) establishes how to determine lighting wattages depending upon the type of lighting technology used.

2. **Alternative 2 - Specific Technology Approach**. This option uses specific, energy-efficient lighting technologies. This option provides a simple specific technology approach for using these energy efficient technologies that are already being used by many in the sign industry.

   The specific energy efficient lighting technologies are listed in §148(b).

7.3.1 Watts Per Square Foot Approach

§148(a) 1.

The first alternative for internally illuminated signs (watts per square foot approach) sets a maximum power allowance of 12 W/ ft² times the area of the sign face. For double-faced signs, only the area of a single face can be used to determine the allowed lighting power. However, for deep sign cabinets where the lamps are isolated by an opaque divider so that they illuminate only one sign face, or for irregular shaped signs where the faces are not parallel and the lamps are shielded by an opaque divider so that they illuminate only one sign face, then the total area of all of the sign faces can be used to determine the allowed lighting power. See Figure 7-1, Figure 7-2, and Figure 7-3.

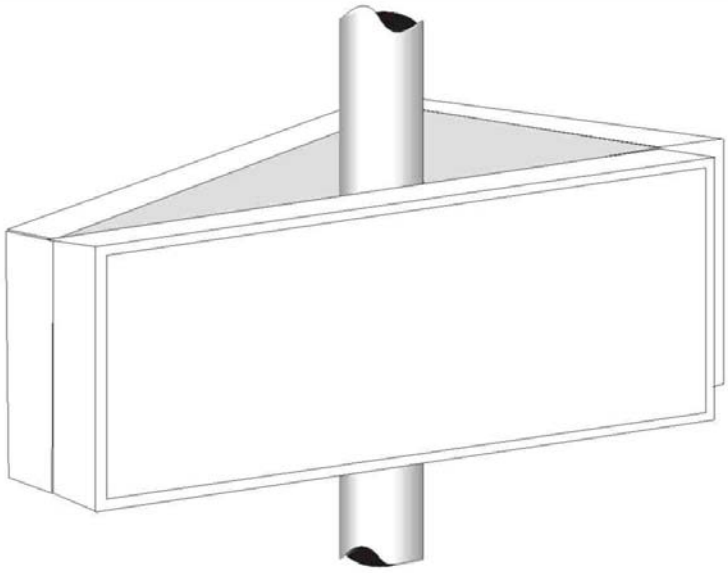


Figure 7-1 – Multi-faced sign

Include Area from Each Face When Separated by Opaque Divider

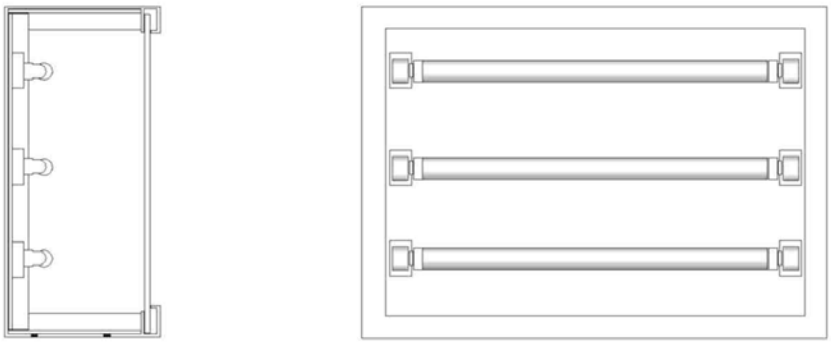


Figure 7-2 – Single-faced Internally Illuminated Cabinet Sign with Fluorescent Lamp and Translucent Face

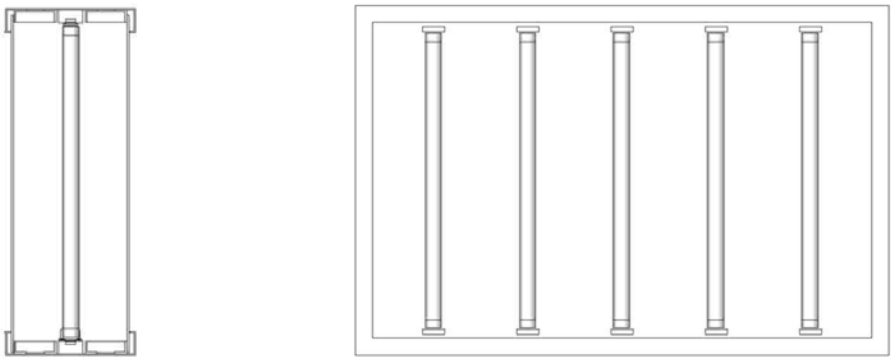


Figure 7-3 – Double-faced Internally Illuminated Cabinet Sign with Fluorescent Lamp and Translucent Faces

For externally illuminated signs the maximum allowed lighting power is 2.3 W/ft² times the area that is illuminated without obstruction or interference. One or more fixtures must illuminate the sign area. See §148(a)2.

7.3.2 Specific Technology Approach

§148(b)

The second alternative (specific technology approach) requires that the sign be illuminated only with one or more of the following light sources, as applicable:

1. High pressure sodium.
2. Pulse start or ceramic metal halide lamps served by a ballast that has a minimum efficiency of 88 percent.
3. Pulse start metal halide lamps that are 320 watts or smaller, are not 250 W or 175 W lamps, and are served by a ballast that has a minimum efficiency of 80 percent.

   For pulse start and ceramic metal lamps, the Standards define ballast efficiency as the measured output wattage to the lamp divided by the measured operating input wattage when tested according to ANSI C82.6-2005.
4. Neon or cold cathode lamps with transformer or power supply efficiency greater than or equal to following:
   a. A minimum efficiency of 75 percent when the transformer or power supply rated output current is less than 50 mA, or
   b. A minimum efficiency of 68 percent when the transformer or power supply rated output current is 50 mA or greater.

   For neon and cold cathode lamps, the Standards define power supply efficiency as the ratio of the output wattage to the input wattage is at 100 percent tubing load.

5. Fluorescent lamps with a minimum color rendering index (CRI) of 80.
6. Light emitting diodes (LEDs) with a power supply having an efficiency of 80 percent or greater.

   For single voltage external power supplies that are designed to convert 120 volt AC input into lower voltage DC or AC output, and which have a nameplate output power less than or equal to 250 W, comply with the applicable requirements of the Appliance Efficiency Regulations (Title 20). See *Exception* to §148(b)5.
7. Compact fluorescent lamps that do not contain a medium base socket (E24/E26).
8. Electronic ballasts with a fundamental output frequency not less than 20 kHz

No other light sources can be used on a sign complying under this option.

A sign may consist of multiple components, where some components are regulated, and some components are not regulated. For example, a single sign structure may have a regulated internally illuminated cabinet, plus regulated externally illuminated letters which are attached to a brick pedestal, plus unregulated unfiltered incandescent “chaser” lamps forming an illuminated arrow. For example, Figure 7-4 shows an arrow which is not part of an electronic message center (EMC) using incandescent lamps. If the lamps are not covered by a lens, then only the control regulations (§133) apply to the sign. This type of unfiltered incandescent sign is not regulated by §148.

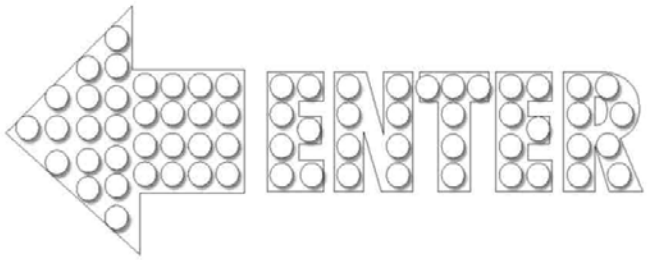


Figure 7-4 – Unfiltered Sign

Figure 7-5 shows an externally illuminated sign using flood lighting, which is regulated by the Standards. The power (wattage) used for these lighting components must comply with the watts per square foot approach, or use only lighting technologies approved according to §148(b).

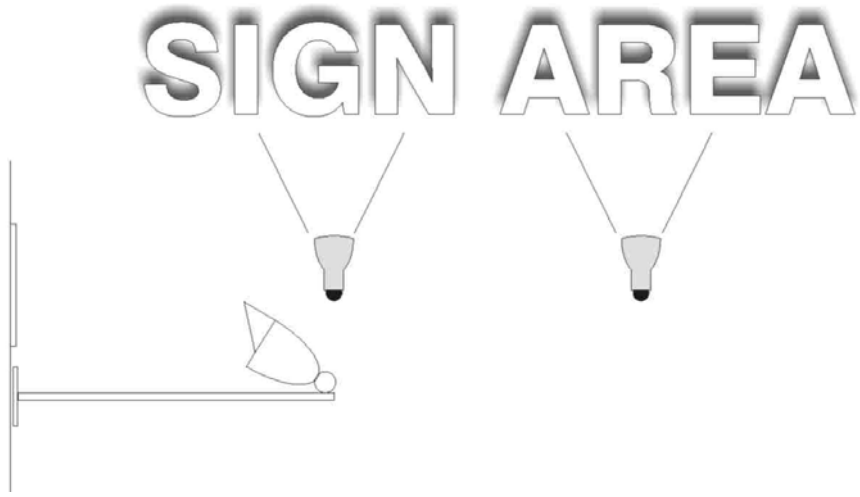


Figure 7-5 – Externally Illuminated Sign Using Flood Lighting

Example 7-8

Question

Can I use neon or cold cathode lights in my sign and comply with the Standards under Alternative 2 (Specific Technology Approach)?

Answer

Yes, neon and cold cathode lights are allowed under the specific technology approach, provided that the transformers or power supplies have an efficiency of 75 percent or greater for output currents less than 50 mA and 68 percent or greater for output currents 50 mA or greater.

Example 7-9

Question

Do signs inside a theater lobby or other indoor environments need to comply with the sign requirements?

Answer

Yes, all internally and externally illuminated signs whether indoor or outdoor must comply with either the specific technology or watts per square foot approach.

Example 7-10

Question

My sign is equipped with both hardwired compact fluorescent lamps and incandescent lamps. Can my sign comply under the specific technology approach?

Answer

No. Since your sign is not exclusively equipped with energy efficient technologies allowed under the specific technology approach (incandescent sources are not allowed), it therefore must

comply under the watts per square foot approach. Your other option is to replace the incandescent sources with an energy efficient option that is permitted under the specific technology approach, such as LED, pulse start or ceramic metal halide, or hard-wired CFL sources.

Example 7-11

Question

My sign has three parts, an internally illuminated panel sign equipped with electronic ballasts, and two unfiltered 30 mA neon signs on top and bottom of the panel sign displaying an illuminated arrow equipped with power supplies with an efficiency of 76 percent. Do this sign comply with the specific technology approach?

Answer

Yes, this sign is essentially made up of three different signs; an internally illuminated panel sign equipped with electronic ballast that complies with the specific technology approach and two unfiltered neon signs with efficient power supplies also that comply with the specific technology approach. Therefore the entire sign complies with the Standards.

Example 7-12

Question

Are signs required to comply with Outdoor Lighting Zone requirements?

Answer

No. Outdoor Lighting Zones do not apply in any way to signs. The Sign Lighting Standards are the same throughout the state; they do not vary with Outdoor Lighting Zones.

7.3.3 Additions and Alterations

§149(a) 1. §149(b)1H

All new signs, regardless of whether they are installed in conjunction with an indoor or outdoor addition or alteration to a building or outdoor lighting system, must meet the requirements for newly installed equipment, as required by §119, §130, §133 and §148.

7.3.4 Sign Alterations

§149(b)1 K

Existing indoor and outdoor internally illuminated and externally illuminated signs that are altered as specified by §149(b)1K are required to meet the requirements of §148. Altered components of existing indoor and outdoor internally and externally illuminated signs must also meet the requirements of §130(d)2, if Watts per square foot Approach is used for compliance.

The lighting power requirements (either specific technology or watts per square foot) are triggered by alterations to existing internally or externally illuminated signs when any of the following occurs as result of the alteration as specified in §149(b)1:

- The connected lighting power is increased.
- More than 50 percent of the ballasts are replaced and rewired.
- The sign is relocated to a different location on the same site or on a different site.

The lighting power requirements are not triggered when just the lamps are replaced, the sign face is replaced or the ballasts are replaced (without rewiring).

These signs must comply with either alternative (a) or alternative (b) of §148. Sign ballast rewiring that triggers the alterations requirements generally involves rewiring from parallel to series or visa versa, or when a ballast(s) is relocated within the same sign requiring relocating the wires. This does not include routine in-place ballast replacements.

Example 7-13

Question

We are replacing 60 percent of the ballasts in a sign. Must we replace the remaining ballasts in the sign in order to comply with the Standards?

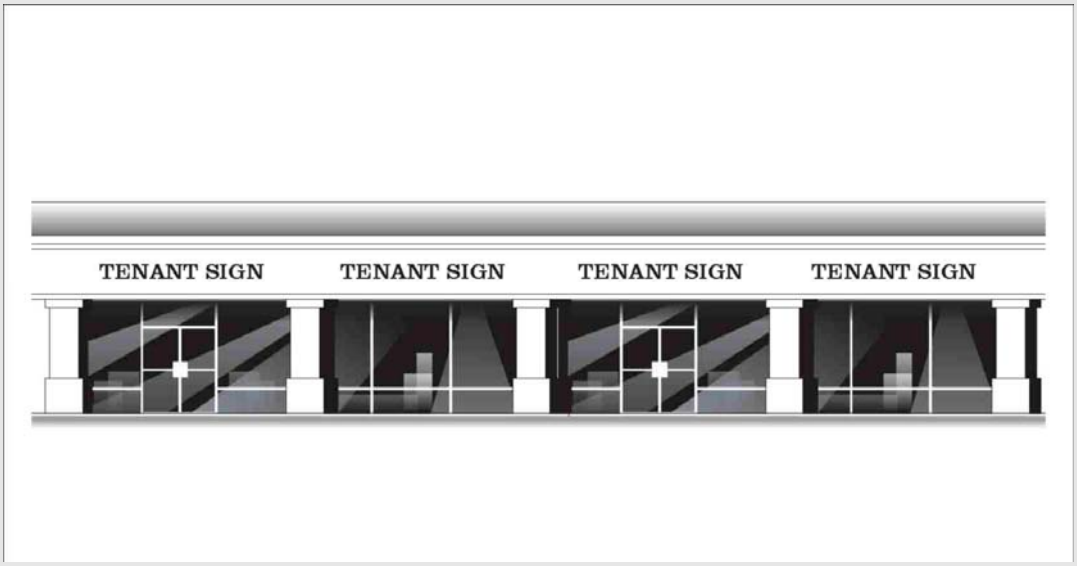
Answer

It depends. If more than 50 percent of the ballasts are being replaced, and the replacement involves rewiring the ballasts, then the alteration requirements apply to the whole sign. If more than 50 percent of the ballasts are being replaced during regular maintenance, and the ballasts are not being rewired, then the sign is not required to meet the Standards requirements. However, when existing wiring will allow the direct replacement of a magnetic ballast with a high efficiency high frequency electronic fluorescent ballast, even though Standards do not require the electronic ballast, the sign owner is encouraged to replace the magnetic ballasts with an electronic ballast.

Example 7-14

Question

I have a strip mall full of signs. Must I immediately bring all of these signs into compliance even if I'm not going to alter them?



Answer

No, only those signs in which at least 50 percent of the ballasts are replaced and rewired, or those signs that are moved to a new location (on the same property or different property) must comply with either Alternative 1 or 2 of §148. Also, all newly installed signs must also comply with either Alternative 1 or 2.

7.4 Sign Lighting Plan Check Documents

At the time a building permit application is submitted to the enforcement agency, the applicant also submits plans and energy compliance documentation. This section describes the required forms and procedures for documenting compliance with the sign lighting requirements of the Standards. It does not describe the details of the requirements; these are presented in Section 7.1.3, Summary of Requirements. The following discussion is addressed to the designer preparing construction documents and compliance, and to the enforcement agency plan checkers who are examining those documents for compliance with the Standards.

For the 2005 Standards, the sign lighting compliance forms were located with a set of outdoor lighting compliance forms (OLTG). However, for the 2008 Standards, the sign lighting compliance forms are stand-alone forms (SLTG). There are only two parts to the 2008 sign lighting compliance forms, which can be printed as a single page, double-sided form for most sign lighting applications.

The use of each part of the sign lighting compliance form is described below, and complete instructions for each part is presented in the following subsection.

7.4.1 SLTG-C: Certificate of Compliance (Sign Lighting)

The SLTG-C Certificate of Compliance form is in two parts. A copy of these forms must be submitted to the enforcement agency at the time of building permit application. With enforcement agency approval, the applicant may use alternative formats of these forms (rather than the official Energy Commission forms), provided the information is the same and in a similar format.

SLTG-1C Page1 of 2

Project Description

- PROJECT NAME is the title of the project, as shown on the plans and known to the enforcement agency.
- PHASE OF CONSTRUCTION indicates the status of the project described in the compliance documents. Refer to Section 1.6 for detailed discussion of the various choices.
- NEW CONSTRUCTION shall be checked for all new signs installed with new construction..
- ADDITION shall be checked an additional new sign in an existing building.
- ALTERATION shall be checked for an alterations to an existing sign.
- FUNCTION TYPE indicates the purpose of the sign usage, either Outdoor Signs or Indoor Signs.
- DATE is the date of preparation of the compliance submittal package. It shall be on or after the date of the plans, and on or before the date of the building permit application.
- PROJECT ADDRESS is the address of the project as shown on the plans and as known to the enforcement agency.
- METHOD OF COMPLIANCE indicates the method of compliance used for the project.
- MAXIMUM ALLOWED LIGHTING POWER has a method for both internally and externally illuminated signs. This method generally allows for more sign power allowed.
- SPECIFIC LIGHTING SOURCES, this method is used for specific lighting applications. See §148(b) for a list of applications.

Declaration Statement of Documentation Author

DOCUMENTATION AUTHOR is the person who prepared the energy compliance documentation and who signs the Declaration Statement. The person's telephone number is given to facilitate response to any questions that arise. A Documentation Author may have additional certifications such as an Energy Analyst or a Certified Energy Plans Examiner certification number. Enter number in the EA# or CEPE# box if applicable.

Declaration Statement of Principle Lighting Designer

The Declaration Statement is signed by the person responsible for preparation of the plans for the sign and the documentation author. This principal designer is also responsible for the energy compliance documentation, even if the actual work is delegated to someone else (the Documentation Author as described above). It is necessary that the compliance documentation be consistent with the plans. The Business and Professions Code governs who is qualified to prepare plans and therefore to sign this statement. See Section 2.2.2 Permit Application for applicable text from the Business and Professions Code.

The person's telephone number is given to facilitate response to any questions that arise.

Mandatory Sign Lighting Controls

The provided check boxes shall be completed as applicable to the project. Each row represents one of the mandatory controls requirements for signs, as the columns indicate whether the controls are installed.

Check yes or no:

Row 1 – Must be checked "Yes" to document compliance for all signs.

- §133(a)1 - All signs with permanently connected lighting are controlled with an automatic time switch control that complies with the applicable requirements of §119.

Row 2 – Only one of the following two check boxes must be "Yes" to document compliance for all signs§133(a)2 - All outdoor signs are controlled with a photo control or outdoor astronomical time switch control.

- Exception to §133(a)2 - A photo control or outdoor astronomical time switch control is not required because the outdoor signs are in tunnels or large covered areas that require illumination during daylight hours.

Row 3 – Only one of the following four boxes must be "Yes" to document compliance for all signs.

- §133(a)3 - All outdoor signs are controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours.
- Exception 1 to §133(a)3 - Outdoor signs are not required to be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours because the signs are illuminated for less than one hour per day during daylight hours.
- Exception 2 to §133(a)3 - Outdoor signs are not required to be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours because the signs are in tunnels or large covered areas that require illumination during daylight hours.

- Exception 3 to §133(a)3 - Outdoor signs are not required to be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours because only metal halide, high pressure sodium, cold cathode, or neon lamps are used to illuminated signs or parts of signs.

Row 4 – Both of the following rows must be checked either “Y”, “N”, or “N/A”. If the sign is an Electronic Message Center (EMC) having a new connected lighting power load greater than 15 kW, one of the following two rows must be checked “Y.” to document compliance.

- §133(a)4 - has a control installed is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal that is sent out by the local utility.
- Exception to §133(a)4 - A control is not required to reduce the lighting power by a minimum of 30 percent when receiving a demand response signal that is sent out by the local utility because the is required by a health or life safety statue, ordinance, or regulation, including but not limited to exit signs and traffic signs.

SLTG-1C Part 2 of 2 Compliance Method

Part 2 of 2 of the SLTG-1C documents the compliance of sign lighting in accordance with §148. Page two serves two functions:

1. To document and certify the compliance method used, and

2. To be used by the enforcement agency as a field inspection energy checklist for sign lighting.

There are two compliance options for signs. Alternative 1 is based on complying with lighting power allowances per square foot of sign. Alternative 2 is based on utilizing only specific lighting technologies.

Unfiltered signs (signs consisting of bare incandescent lamps or bare neon tubing) are not regulated by §148. However, these signs are required to meet the mandatory control requirements in §133 as applicable.. For hybrid signs, consisting of one or more components of internally illuminated, externally illuminated, and unfiltered components, each regulated component shall comply with Standards separately.

- PROJECT NAME is the title of the project. This name must match the information listed on SLTG-C Part 1 of 2.
- DATE must match the information listed on SLTG-C Part 1 of 2

Fill in COLUMN A and COLUMN B for all signs, regardless of compliance method.

A: SIGN SYMBOL or code is the identifying designation of the system and shall be consistent with the plans

B: DESCRIPTION OR LOCATION is a narrative describing the system and its location as specified on the plans.

Fill in COLUMNS C through H only for signs complying with the Maximum Allowed Lighting Power method.

C: SIGN AREA is the area of the sign in square feet. Total all rows on the bottom row of this table.

D: INTERNALLY OR EXTERNALLY, list "I" if the sign is internally illuminated, or "E" if the sign is externally illuminated. If a sign has both internally and externally illuminated components, enter the sign components on separate lines.

E: ALLOWED LIGHT POWER DENSITY (LPD), depending if the sign or sign component is internally illuminated, enter "12" W/ft^2, or enter "2.3" W/ft^2 if the sign or sign component is externally illuminated.

F: ALLOWED WATTS is the product of the SIGN AREA (column C) and the LPD (column E).

G: TOTAL INSTALLED WATTS is calculated total installed watts in the sign, as determined according to the applicable provisions of §130(d).

H: COMPLIES, the sign complies under the Maximum Allowed Lighting Power method if COLUMN F is smaller than COLUMN G, enter "Y". If COLUMN G is larger than COLUMN F, enter "N", the sign does not comply using this method. (However, the sign may still comply using the Alternative Light Source method if only approved technologies are used).

K: FIELD INSPECTOR either passes or fails the field inspection of the maximum allowed lighting power for that particular sign.

Fill In COLUMN I only for signs complying with the Alternative Light Source method.

In Column I, List a number from 1 through 10 as appropriate for each Alternative Light Source installed in the sign. Internally illuminated or externally illuminated signs which use any lighting technology not listed below shall not use this method for compliance, but must comply through the use of the Maximum Allowed Lighting Power method. List all numbers that apply from the list of compliant technologies shown below, for the sign shown on that row of the table:

1. High pressure sodium lamps
2. Pulse start or ceramic metal halide lamps served by a ballast with ≥ 88 percent efficiency
3. Pulse start metal halide lamps that are ≤ 320 W, are not 250 W or 175 W lamps, and are served by a ballast with ≥ 80 percent efficiency
4. Neon or cold cathode lamps with transformer or power supply efficiency ≥ 75 percent with rated output current < 50 mA
5. Neon or cold cathode lamps with transformer or power supply efficiency ≥ with rated output current ≥ 50 mA
6. Fluorescent lamps with a minimum color rendering index (CRI) of 80
7. Light emitting diodes (LEDs) with a power supply with ≥ 80 percent efficiency

8. Single voltage LED external power supplies designed to convert 120 volt AC input into lower voltage DC or AC output, having a nameplate output power less than or equal to 250 W, and certified to the Energy Commission as complying with the applicable requirements of the Appliance Efficiency Regulations (Title 20)
9. Compact fluorescent lamps that do not contain a medium screw base sockets (E24/E26)
10. Electronic ballasts with a fundamental output frequency ≥ 20 kHz

COLUMN J is reserved for the building inspector. The checkboxes provided are to indicate whether the project complies with either the Maximum Allowed Lighting Power method or the Alternative Light Source method.

7.5 Lighting Inspection

The electrical building inspection process for energy compliance is carried out along with the other building inspections performed by the enforcement agency. The inspector relies upon the plans and upon the SLTG-C Certificate of Compliance form.

No Acceptance Test is required.